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BEYER WEAVER & THOMAS LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER
RAMPURIA, SATISH

ART UNIT	PAPER NUMBER
2191	

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/886,454	SOKOLOV ET AL.
	Examiner	Art Unit	
	Satish S. Rampuria	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 August 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>5,8,10-17,21 and 24</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>5,8,10-17,21 and 24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/1/05</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

1.   This action is in response to the RCE filed on 08/01/2005.

2.   Claims cancelled (previously) by the applicant: 1-4, 6-7, 9, 18-20, 22-23, and 25-27.

3.   Claims amended by the applicant: 5, 8, 15-17, 21 and 24.

4.   Claims 5, 8, 10-17, 21 and 24 are pending.

5.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 08/01/2005 has been entered.

Response to Arguments

6.   Applicant's arguments with respect to claims have been considered but they are not

persuasive.

In the remarks, the applicant has argued that:

(i)   Crelier does not teach or suggest an object representation that includes an array of

references such that each reference in the array references an instance field of the

object being represented (claim 5).

(ii)   The combination of Crelier and Brown do NOT teach or suggest an object

representation that includes a first reference to an internal class representation that

includes a header of predetermined size which is immediately followed by a method

table (claim 5)

(iii)   Crelier does NOT teach or suggest an object representation that includes a direct

reference to an internal class representation (claim 8)

Examiner's response:

(i)   In response to Applicant's argument, Crelier disclose a virtual machine for executing

programs written in the Java programming language (see summary col. 3 to 4, lines

40-67 and 1-55). Crelier does disclose object representation that includes an array of

references that are included in the class (see col. 8,lines 53-61 and fig. 4 and related

discussion) in which Crelier uses various types of pointers and references to different

types of objects. Further, With respect to Applicant's argument that the limitation an

object representation...being presented" as recited in amended claim 5, has not been

considered in the previous action (mailed on 04/07/2005). Examiner respectfully

disagree with the Applicant as indicated in the Advisory Action mailed on 07/01/2005

by the Examiner, and furthermore, clarify that these limitations were NOT even

recited in claim 5 (Amendment filed on 01/11/2005) in the context as it is appears

now. Therefore, limitations cannot be addressed by the Examiner. Applicants only

makes general allegations and does not point out any errors in the rejection.

Therefore, the rejection is proper and maintained herein.

(ii)   In response to applicant's argument that there is no suggestion to combine the

references, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed

invention where there is some teaching, suggestion, or motivation to do so found

either in the references themselves or in the knowledge generally available to one of

ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir.

1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case,

Crelier and Brown both teach and suggest the execution of JAVA using virtual

machine. Specifically, Brown teaches the predetermined size of the header in the file

(see the rejection below). Applicants only makes general allegations and does not

point out any errors in the rejection. Therefore, the rejection is proper and maintained

herein.

(iii)   In response to Applicant's arguments, the response to the argument to claim 5(i) also

applies here as well.

Information Disclosure Statement

7.   An initialed and dated copy of Applicant's IDS form 1449 filed on 08/01/2005 is attached

to the instant Office action.

Claim Objections

8.   Claim 21 objected to because of the following informalities: The limitation "A apparatus"

should be "An apparatus".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9.   The following is a quotation of the **second paragraph** of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10.   Claims 5, 8, 15 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Clarification and/or correction are required.

Regarding, claims 5, 8, 15 and 21, the limitation, "can be" should be deleted it is unclear as to whether the reference is capable of invoking/accessing the methods.

Regarding, claims 15 and 21, the limitation, "should be" should be deleted it is unclear as to whether the method is invoked/accessed.

Regarding, claims 15 and 21, the limitation, "determining determines" it is unclear as to what is a determining (i.e., is a processor or a call etc.) that determines.

The rejection of the base claim is necessarily incorporated into the dependent claims.

Claim Rejections - 35 USC § 102

11.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if

the international application designated the United States and was published under Article 21(2) of such treaty in the English
language.

12.   Claims 8, 10, 11, 13-15, 17 and 21 are rejected under 35 U.S.C. 102(e) as being

anticipated by US Patent No. 6,151,703 to Crelier, hereinafter called Crelier.

Per claim 8:

Crelier discloses:

- allocating a first reference in a memory portion of said virtual machine (col. 8, lines 16-17

   "the object handle 401 includes a pointer referencing a method table or virtual table ("v

   table")"), wherein said first reference is a reference to an internal class representation of said

   object, wherein said internal class representation is a presentation inside said virtual

   machine of a class (or class file) associated with said object of said object-based

   programming environment (col. 7, lines 63-64 "When a Java application is executed, the

   virtual machine 220 loads one or more class files" also, Fig. 3 and related discussion),

   wherein said first reference is a direct reference to said internal class representation (col. 8,

   lines 16-17 "the object handle 401 includes a pointer referencing a method table or virtual

   table ("v table")"), and wherein said first reference can be used to invoke one or more

   methods associated with said object at runtime (col. 8, lines 5-7 "At runtime, one or more

   objects are instantiated from classes. FIG. 4 illustrates the layout of a typical runtime object

   400");

- allocating a second reference in a memory portion of said virtual machine (col. 8, lines 16-

   17 "the object handle 401 includes a pointer referencing a method table or virtual table ("v

   table")"), wherein said second reference is a reference to instance fields of said object (col.

   8, lines 21-22 "the method table 420 includes a pointer 421 pointing to a ClassClass

descriptor 430"), and wherein said second reference can be used to access one or more

instance fields of said object at runtime; wherein said second reference is a reference to an

array of references (col. 8, lines 5-7 "At runtime, one or more objects are instantiated from

classes. FIG. 4 illustrates the layout of a typical runtime object 400"), wherein each

reference in said array of references is a reference to an instance field associated with said

object (col. 8, lines 21-22 "the method table 420 includes a pointer 421 pointing to a

ClassClass descriptor 430"); and wherein each of said instance fields can be accessed by

indexing said array of references (col. 8, lines 21-22 "the method table 420 includes a

pointer 421 pointing to a ClassClass descriptor 430").

Per claim 10:

The rejection of claim 8 is incorporated, and further, Crelier disclose:

- wherein said first reference is allocated as four bytes (col. 10, lines 62-64 "The third slot

  stores a pointer (e.g., 32-bit address pointer) to compiled code, Compiled Code, which

  corresponds to the compiled code slot 463"). Further, 8 bit equal to 1 byte, therefore, 32 bit

  equal to 4 bytes.

Per claim 11:

The rejection of claim 8 is incorporated, and further, Crelier disclose:

- wherein said first reference is allocated as four bytes (col. 10, lines 62-64 "The third slot

  stores a pointer (e.g., 32-bit address pointer) to compiled code, Compiled Code, which

corresponds to the compiled code slot 463"). Further, 8 bit equal to 1 byte, therefore, 32 bit equal to 4 bytes.

Per claim 13:

The rejection of claim 8 is incorporated, and further, Crelier disclose:

- storing a hash key that represents the object (col. 8, lines 42-43 "unsigned long this hash; unsigned long total hash").

Per claim 14:

The rejection of claim 8 is incorporated, and further, Crelier disclose:

- wherein said hash key is the memory address of said first reference (col. 8, lines 42-43 "unsigned long this hash; unsigned long total hash").

Per claim 15:

Crelier discloses:

- A method for accessing information associated with an object of an object-based programming environment which has been represented in an internal object representation inside a virtual machine(col. 3, lines 44-45 "a virtual machine for executing programs written in the Java programming language"), said method comprising:
- identifying an internal object representation for said object inside said virtual machine (col. 3, lines 50-52 "The program comprises objects created from Java classes; each class defines data and methods for the class");

- determining whether a method associated with said object should be invoked or an instance field associated with said object should be accessed (col. 4, lines 17-20 "an "invoker" slot is employed from all calls from an interpreted caller (or the runtime interpreter) to the callee method (i.e., the method associated with the method block);

- using a first reference in said internal object representation to locate an appropriate internal class representation(col. 8, lines 16-17 "the object handle 401 includes a pointer referencing a method table or virtual table ("v table")") inside said virtual machine when said determining determines that a method should be invoked (col. 7, lines 63-64 "When a Java application is executed, the virtual machine 220 loads one or more class files" also, Fig. 3 and related discussion), wherein said internal class representation is a representation inside said virtual machine of a class (or class file) associated with said object of said object-based computing environment, and wherein said internal class representation includes a method table which can be used to invoke one or more methods associated with said object (col. 8, lines 16-17 "the object handle 401 includes a pointer referencing a method table or virtual table ("v table")"); and

- using second reference in said internal object representation to locate one or more instance fields of said object when said determining determines that an instance field should be accessed (col. 4, lines 17-20 "an "invoker" slot is employed from all calls from an interpreted caller (or the runtime interpreter) to the callee method (i.e., the method associated with the method block), wherein second reference can be used to directly access said one or more instance fields of said object (col. 8, lines 16-17 "the object handle 401 includes a pointer referencing a method table or virtual table ("v table")"), where in said

second reference is a reference to an array of references (col. 8, lines 21-22 "the method

table 420 includes a pointer 421 pointing to a ClassClass descriptor 430"), wherein each

reference in said array of references is a reference to an instance field associated with said

object (col. 8, lines 21-22 "the method table 420 includes a pointer 421 pointing to a

ClassClass descriptor 430"), and wherein each of said instance fields can be accessed by

indexing said array of references (col. 8, lines 21-22 "the method table 420 includes a

pointer 421 pointing to a ClassClass descriptor 430").

Per claim 17:

The rejection of claim 15 is incorporated, and further, Crelier discloses:

-   wherein said information regarding said objectf further includes a field descriptor table (col.

    8, lines 21-22 "the method table 420 includes a pointer 421 pointing to a ClassClass

    descriptor 430")

Claim 21 is the apparatus claim corresponding to method claim 15 and rejected under the same

rational set forth in connection with the rejection of claim 15 above.

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14.   Claims 5, 12, 16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Crelier in view of US Patent No. 6,237,043 to Brown et al., hereinafter called Brown.

Per claim 5:

Crelier disclose:

- A computer readable medium including computer program code for representing an

  object of an object-based programming environment as an object representation inside

  virtual machine, wherein said object representation is suitable for use by said virtual

  machine(col. 3, lines 44-45 "a virtual machine for executing programs written in the Java

  programming language"), said computer readable medium comprising:

- computer program code for allocating a first reference to an internal class representation

  inside said virtual machine (col. 8, lines 16-17 "the object handle 401 includes a pointer

  referencing a method table or virtual table ("v table")"), wherein said internal class

  representation is a representation inside said virtual machine for a class associated with

  said object of said object based programming environment (col. 7, lines 63-64 "When a

  Java application is executed, the virtual machine 220 loads one or more class files" also,

  Fig. 3 and related discussion) and wherein said first reference can be used to invoke one

  more methods associated with said object and said class (col. 4, lines 17-20 "an "invoker"

  slot is employed from all calls from an interpreted caller (or the runtime interpreter) to

  the callee method (i.e., the method associated with the method block)"); and

- computer program code for allocating a second reference to instance fields of said object

  (col. 8, lines 21-22 "the method table 420 includes a pointer 421 pointing to a ClassClass

  descriptor 430") which is represented by said representation inside said virtual machine,

    wherein said second reference has been allocated and can be used to access one or more

instance fields of said object at run time (col. 8, lines 5-7 "At runtime, one or more

objects are instantiated from classes. FIG. 4 illustrates the layout of a typical runtime

object 400");

- computer program code for storing a hash key that can be used to identify the object,

  wherein said hash key is the memory address or said first reference (col. 8, lines 42-43

  "unsigned long this hash; unsigned long total hash");

- wherein said second reference is a reference to an array of references (col. 8, lines 16-17

  "the object handle 401 includes a pointer referencing a method table or virtual table ("v

  table")"), wherein each reference is said array of references is a reference to an instance

  field associated with said object (col. 8, lines 21-22 "the method table 420 includes a

  pointer 421 pointing to a ClassClass descriptor 430"), and wherein each of said instance

  fields can be accessed by indexing said array of references (col. 8, lines 21-22 "the

  method table 420 includes a pointer 421 pointing to a ClassClass descriptor 430"); and

- wherein a method table associated with said Java object is allocated immediately after

  said header (col. 10, lines 62-64 "The method table 420 includes a pointer 423 to the

  method block for the class (or superclass, if this in an inherited class)").

Crelier does not explicitly disclose internal class representation includes a header of a

predetermined size.

    However, Brown, in an analogous computer system discloses internal class representation

includes a header of a predetermined size (col. 3, lines 58-61 "an object by defining a memory

area within the object's header... contains the locking mechanism or a pointer to a locking

mechanism" and col. 4, lines 12-13 "allocate additional header memory area... object is

created").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time

the invention was made to incorporate the method of including header with memory allocated

area within the object as taught by Brown onto the method of executing Java programming code

as taught by Crelier. The modification would be obvious because of one of ordinary skill in the

art would be motivated to predetermine the header size to not to overhead the memory as

suggested by Brown (col. 3, lines 35-48).

Claim 12 is the method claim corresponding to computer program product claim 5 and rejected

under the same rational set forth in connection with the rejection of claim 5 above.

Per claim 16:

The rejection of claim 15 is incorporated, and further, Crelier discloses:

-   wherein a method table associated with said Java object is allocated immediately after said

    header (col. 10, lines 62-64 "The method table 420 includes a pointer 423 to the method

    block for the class (or superclass, if this in an inherited class)"); and

-   skipping a header of said internal class representation to access a method table associated

    with said Java object (col. 8, lines 62-64 "The method table 420 includes a pointer 423 to

    the method block for the class (or superclass, if this in an inherited class)").

Crelier does not explicitly disclose internal class representation includes a header of a

predetermined size.

However, Brown, in an analogous computer system discloses internal class representation

includes a header of a predetermined size (col. 3, lines 58-61 "an object by defining a memory

area within the object's header... contains the locking mechanism or a pointer to a locking

mechanism" and col. 4, lines 12-13 "allocate additional header memory area... object is

created").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the

invention was made to incorporate the method of including header with memory allocated area

within the object as taught by Brown onto the method of executing Java programming code as

taught by Crelier. The modification would be obvious because of one of ordinary skill in the art

would be motivated to predetermine the header size to not to overhead the memory as suggested

by Brown (col. 3, lines 35-48).

Claim 24 is the system claim corresponding to computer program product claim 5 and rejected

under the same rational set forth in connection with the rejection of claim 5 above.

Conclusion

15.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Satish S. Rampuria** whose telephone number is **(571) 272-3732**.

The examiner can normally be reached on **8:30 am to 5:00 pm** Monday to Friday except every

other Friday and federal holidays. Any inquiry of a general nature or relating to the status of this

application should be directed to the **TC 2100 Group receptionist: 571-272-2100**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Tuan Q. Dam** can be reached on **(571) 272-3695**. The fax phone number for the

organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria
Patent Examiner/Software Engineer
Art Unit 2191
10/03/2005

ANIL KHATRI
PRIMARY EXAMINER